BatLab Basic Project Kit - Tilt Sensor/Switch

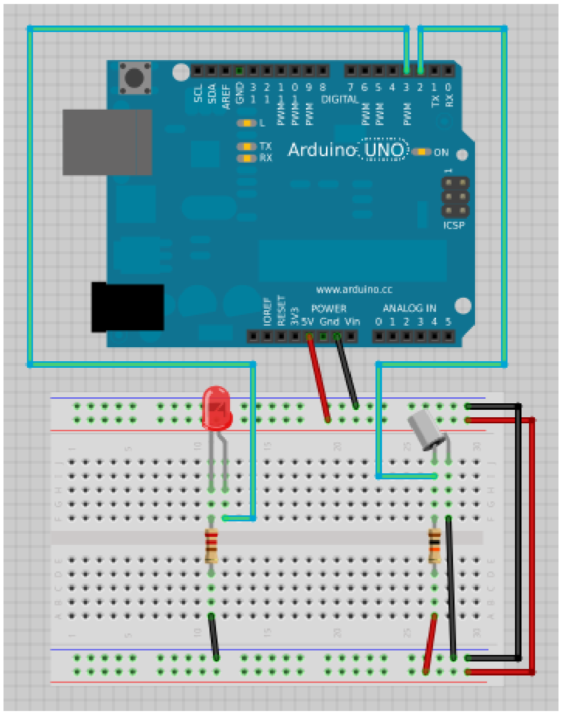
HOW IT WORKS

The tilt sensor is a simple, easy-to-use device that detects its orientation or inclination. Inside the glass, there is a small drop of mercury that closes the contacts when tilted. This device can be used just like a pushbutton switch (example in the Sparkfun guide or in File -> Examples -> Digital -> Button in the Arduino IDE). The code here adds an optional "debouncing" feature that waits for the electrical noise or "bounce" to settle when a switch is closed and allows for a cleaner read of the switch's state.

PARTS

- Arduino Uno, breadboard, and jumper wires
- Tilt sensor/switch
- LED (any color)
- 10KΩ resistor (silver marking) – to tilt sensor
- 220Ω resistor (red marking) – to LED

CIRCUIT



CODE

```
/* BatLab Basic Project Kit

 Tilt Sensor/switch example

Wiring note: the 10KΩ resistor is used here to "pull up" the signal to 5V
when the switch is open(sensor is tilted), ensuring that the Arduino reads a
HIGH in that case;  when the sensor is upright, the mercury closes the
circuit and the signal is connected to ground, or 0V, so the Arduino then
reads a LOW. Without the pull up resistor, the signal will "float" when the
switch is open and you will get unpredictable results from reading the pin.

*/

const int sensorPin = 2;
const int ledPin = 11;

int ledState = HIGH;
int reading;
int previous = LOW;

long time = 0;
long debounce = 50;  //time in milliseconds to wait before changing the LED

void setup()
{
pinMode(sensorPin, INPUT);
digitalWrite(sensorPin, HIGH);
pinMode(ledPin, OUTPUT);
}

void loop()
{
  int switchState;
  reading = digitalRead(sensorPin);  //reading will be HIGH when switch is
open

  // Debouncing in case the signal is noisy

  if (reading != previous)
  {
    time = millis();  //the millis() function is like a time stamp
  }

  // If the signal has changed in less than the debounce time, ignore it
  if ((millis() - time) > debounce)
  {
    switchState = reading;

    if (switchState == HIGH)  //the sensor is tilted
      ledState = LOW;         //so turn the LED off
    else                      //the sensor is upright
      ledState = HIGH;        //so turn the LED on
  }
  digitalWrite(ledPin, ledState);  //send HIGH or LOW to the LED
  previous = reading;
}
```